

PROGRAMME

Organization chart Wandfluh Group



Wandfluh Holding



Wandfluh AG
Frutigen/CH



Wandfluh of America Inc.
Mundelein/USA



Wandfluh GmbH
Emmingen/D



Wandfluh UK Ltd
Southam/GB



Wandfluh France
Aix en Provence/F



Wandfluh China
Shanghai/CN



Wandfluh Produktions AG
Frutigen/CH

Core points

- ▶ Customer-oriented, flexible marketing
- ▶ Integrated thinking with respect to product design
- ▶ Swiss manufacturer
- ▶ Worldwide sales
- ▶ Short delivery times
- ▶ Quality both in materials used and services provided
- ▶ ISO 9001-certified since 1992



Characteristics

- ▶ Family-owned joint-stock company, H.R. Wandfluh, Director of the Holding
- ▶ More than 300 employees
- ▶ Group companies in CH, USA, D, GB, F, CN
- ▶ Sales partners in over 30 countries



MOUNTAINS, PEOPLE, PRODUCTS

«We work in a place where other people go for their holidays...»

The 4000 meter high mountains of the Bernese Oberland form the backdrop to the company and appear to symbolise the courage, staying power and delight in innovation that Wandfluh has shown.



«It was people who made the company what it is today, and it is still the people who are playing the decisive part in the company's success...»

Wandfluh AG has a comprehensive range of hydraulic components with many different designs and functionalities. The company is well-known for products that can be used in demanding hydraulic applications. The main focus is on spool valves, poppet valves, proportional valves, electronic components, miniature hydraulics and cartridge valve technology.



BRANCHES

INDUSTRY

Reliability in case of precise recurring sequences.

Requirements

- ▶ High precision
- ▶ Good reproducibility
- ▶ Sensitive control characteristics
- ▶ Compactness
- ▶ High degree of maintenance convenience
- ▶ Long service life

Characteristics

- ▶ Hydraulic valves (up to 350 bar / 120 l/min)
- ▶ Digital driving electronics (individual parameterisation)
- ▶ Hydraulic valves with integrated electronics (plug & play)
- ▶ NG3, NG4 for compact applications
- ▶ Individual customer-specific adaptations

Applications

- ▶ Cutting feed control with positioning
- ▶ Axes positioning
- ▶ Variable workpiece clamping
- ▶ Controlled force transmission in cutting installations
- ▶ Hydraulic bearing
- ▶ Tension control of coiling machines

MOBILE

Reliability despite concentrated power in the tightest space.

Requirements

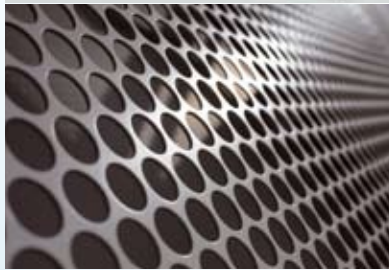
- ▶ Robustness
- ▶ Compactness
- ▶ High reliability
- ▶ Long service life

Characteristics

- ▶ Proportional spool valves and poppet valves
- ▶ Digital driving electronics
- ▶ Hydraulic valves with integrated electronics and field bus
- ▶ Individual customer-specific adaptations

Applications

- ▶ Free of oil leakage holding and controlled lowering of loads
- ▶ Fan drive speed control
- ▶ Access platform control
- ▶ Power - and speed control
- ▶ Axes control
- ▶ Bucket steering
- ▶ Grinding of railway rails
- ▶ Drilling of stone





OIL + GAS

Reliability despite difficult conditions.

Requirements

- ▶ Explosion protection
- ▶ Corrosion protection
- ▶ High reliability
- ▶ Long service life

Characteristics

- ▶ Explosion protection valves (Ex em, Ex d, Ex ia)
- ▶ Corrosion protected valves (up to stainless steel) AISI 316L
- ▶ Spool valves with low leakage rate
- ▶ Individual customer-specific adaptations

Applications

- ▶ Oil drilling head control
- ▶ Winch power control
- ▶ Flap control on oil-, LNG-tankers and container ships
- ▶ Applications in the petrochemical industry

MARINE

Reliability on, in and around the open sea.

Requirements

- ▶ Corrosion protection
- ▶ Low leakage rate
- ▶ High reliability
- ▶ High power density

Characteristics

- ▶ Corrosion protected valves (up to stainless steel)
- ▶ Spool valves with low leakage rate
- ▶ Valves for underwater applications
- ▶ Individual customer-specific adaptations

Applications

- ▶ Axis steering of port cranes
- ▶ Winch controls
- ▶ Remote actuation of ball valves and butterfly valves
- ▶ Steering of ROVs

ENERGY

Reliability when utilising natural resources.

Requirements

- ▶ High reliability
- ▶ Long service life
- ▶ Low failure rate
- ▶ Corrosion protection

Characteristics

- ▶ Corrosion protected valves (up to stainless steel)
- ▶ Reduced electric power
- ▶ Redundant systems
- ▶ Individual customer-specific adaptations
- ▶ Digital controller electronics
- ▶ Precise proportional valves

Applications

- ▶ Steam flap controller
- ▶ Adjustment of rotor blades
- ▶ Actuation of disc brakes
- ▶ Turbine controller
- ▶ Process control

POINTS OF FOCUS

Spool valves

- ▶ Spool valves according to the 5-chamber principle
- ▶ Electrically, mechanically, pneumatically and hydraulically actuated
- ▶ Precise spool fit
- ▶ Low leakage rate
- ▶ Flange design
- ▶ Large standard programme
- ▶ Many additional functions
- ▶ For the directional controlling of cylinders and hydraulic motors



Poppet valves

- ▶ Metal-on-metal sealing seat design
- ▶ Electrically, mechanically and pneumatically actuated
- ▶ Flow in both directions
- ▶ Tight sealing in all flow directions
- ▶ Cartridge-, flange- and sandwich style construction
- ▶ Large standard programme
- ▶ Many additional functions
- ▶ For holding loads as well as for tensioning- and clamping functions



Proportional hydraulics

- ▶ Directional-, pressure - and control valves
- ▶ Actuation by means of proportional solenoid
- ▶ Also available with integrated electronics «DSV»
- ▶ High resolution
- ▶ Good reproducibility
- ▶ Low hysteresis
- ▶ Cartridge-, flange- and sandwich style construction
- ▶ For the control and closed-circuit control of automated processes



Electronics

- ▶ Digital and analogue electronics
- ▶ From the amplifier right to the axis controller
- ▶ Plugs, Eurocards and snap-on modules
- ▶ Also integrated in proportional valve «DSV»
- ▶ Parametrisation by means of convenient software
- ▶ High operational convenience
- ▶ Easy handling
- ▶ Implementation of complex control- and closed-circuit control tasks





Cartridges

- ▶ Functional part for compact designs
- ▶ ISO screw-in cartridges
- ▶ Poppet -, pressure - and flow valves
- ▶ Mechanical actuation by means of key or turning knob
- ▶ Electrical actuation by means of switching - or proportional solenoid
- ▶ Simple and precise adjustment
- ▶ For installation in control blocks and line mount bodies



Explosion- and corrosion protection

- ▶ Extensive product range
- ▶ Electric operating means for all explosion hazard areas
- ▶ Gas, dust and mining
- ▶ Pressure-proof encapsulation and intrinsically safe in accordance with ATEX and IECEx
- ▶ Enhanced corrosion protection right up to stainless versions AISI 316L
- ▶ In applications, in which enhanced corrosion protection or explosion protection are required



Miniature hydraulics

- ▶ Space- and weight-saving valves
- ▶ Electric actuation with reduced power
- ▶ With reduced volume flows a but high pressure
- ▶ Cartridge -, flange - and sandwich style construction
- ▶ Complete product range with all standard functions and actuation methods
- ▶ High power density
- ▶ Compact design
- ▶ For applications where the smallest dimensions and weights are of primary importance



Individual solutions

- ▶ Applications and customer-specific solutions with the experience acquired from standard components
- ▶ Hardware and Software for solutions optimized for the application
- ▶ Elaborated in accordance with customer specifications
- ▶ Individual sales- and technical support
- ▶ Involvement of the specialists during the planning- and production phases
- ▶ Hydraulics and electronics optimally matched to one another
- ▶ A lot of know-how from a single source
- ▶ From the engineering right to the commissioning

SPOOL VALVES

Description

- ▶ Spool valves according to the 5-chamber principle
- ▶ Long service life due to optimum spool guiding
- ▶ Flange design
- ▶ For the directional controlling of cylinders and hydraulic motors

Characteristics

- ▶ Direct- and pilot operated
- ▶ Detented, spring-centered or with spring reset
- ▶ Precise spool fit
- ▶ Low leakage rate

Nominal sizes

- ▶ NG3-Mini Wandfluh standard
- ▶ NG4-Mini Cetop RP121 H-P02
- ▶ NG4 ISO 4401-02
- ▶ NG6 ISO 4401-03
- ▶ NG10 ISO 4401-05

Actuation

- ▶ Solenoid actuated by means of switching solenoid
- ▶ Manually actuated by means of hand lever
- ▶ Mechanically actuated by means of roller
- ▶ Pneumatically actuated
- ▶ Hydraulically actuated

Additional versions

- ▶ Special spools
- ▶ Soft-switching versions
- ▶ Enhanced corrosion protection
- ▶ Special spool play for low leakage
- ▶ Sandwich design types
- ▶ Explosion protection
- ▶ Switching position control
- ▶ Various type of electrical connections
- ▶ Special voltages
- ▶ Low power valves



	NG3	NG4	NG6	NG10
Q _{max}	15 l/min	20 l/min	80 l/min	100 l/min
p _{max}	350 bar	350 bar	350 bar	350 bar



POPPET VALVES

Description

- ▶ Metal-on-metal sealing seat design
- ▶ 2/2- and 3/2-way executions
- ▶ Cartridge-, flange- and sandwich style construction
- ▶ For holding loads as well as for tensioning- and clamping functions

Characteristics

- ▶ Direct- or pilot operated
- ▶ Guided poppet design with equal surface areas on both sides and pressure balanced
- ▶ Excellent seal as a result of metal-on-metal sealing seat
- ▶ Tight seal in all directions of flow

Nominal sizes

Slip-in cartridges:

- ▶ NG3, 4, 6 and 10 Wandfluh standard

Screw-in cartridges:

- ▶ M18, 22 und 33 ISO 7789

Flange, sandwich:

- ▶ NG3-Mini Wandfluh standard
- ▶ NG4-Mini Cetop RP 121 H-P02
- ▶ NG6 ISO 4401-03
- ▶ NG10 ISO 4401-05

Actuation

- ▶ Solenoid actuated by means of switching solenoid
- ▶ Manually actuated by means of hand lever
- ▶ Pneumatically actuated

Additional versions

- ▶ Special circuit symbols
- ▶ Soft-switching version
- ▶ Enhanced corrosion protection
- ▶ Special actuations
- ▶ Explosion protection
- ▶ Switching position control
- ▶ Detented version
- ▶ Power reducing plug
- ▶ Various electrical connections
- ▶ Special voltages

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PROPORTIONAL HYDRAULICS

Description

- ▶ Electric continuous control of flow and pressure
- ▶ Actuation by means of proportional solenoid
- ▶ Cartridge-, flange- and sandwich style construction
- ▶ For the control and closed-circuit control of automated processes

Characteristics

- ▶ Direct- and pilot operated
- ▶ Nominal voltages 12 VDC and 24 VDC
- ▶ High resolution
- ▶ Good reproducibility
- ▶ Low hysteresis

Functions

- ▶ Directional valves
- ▶ Pressure relief valves
- ▶ Pressure control valves
- ▶ Throttle valves
- ▶ Flow control valves

Nominal sizes

Screw-in cartridges:

- ▶ M18, 22 and 33 ISO 7789

Flange, sandwich:

- ▶ NG3-Mini Wandfluh standard
- ▶ NG4-Mini Cetop RP121 H-P02
- ▶ NG6 ISO 4401-03
- ▶ NG10 ISO 4401-05

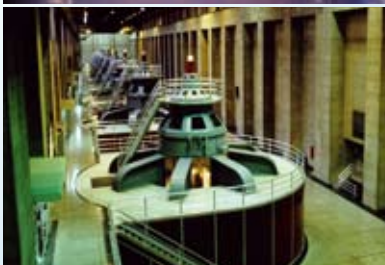
Additional versions

- ▶ Explosion protection
- ▶ Enhanced corrosion protection
- ▶ Valves with integrated electronics
- ▶ Inverse functions
- ▶ Various electrical connections
- ▶ Load-compensated directional valves



	NG3	NG4	NG6	NG10	M18	M22	M33
Qmax	8 l/min	20 l/min	60 l/min	100 l/min	25 l/min	100 l/min	230 l/min
pmax	350 bar	400 bar	400 bar	400 bar	400 bar	400 bar	400 bar

ELECTRONICS



Description

- ▶ From the amplifier to the axis controller
- ▶ For actuating proportional valves
- ▶ Digital and analogue electronics
- ▶ Various types of construction
- ▶ Parameterisation of the digital versions by means of userfriendly software
- ▶ Support of various fieldbus technologies
- ▶ Implementation of complex control- and circuit control tasks

Characteristics

- ▶ High operational convenience
- ▶ Easy handling
- ▶ Support of all current- and voltage signals
- ▶ High functionality as a standard
- ▶ Linear ramping functions
- ▶ Fixed setpoint values
- ▶ Nominal voltages 12 VDC and 24 VDC
- ▶ Software-download via Internet
- ▶ Expandable as per specific customer requirements

Functions

- ▶ Digital- and analogue amplifiers
- ▶ Digital 1-axis and 2-axis controllers
- ▶ Digital pressure controllers
- ▶ Digital volume controllers

Parameterisation

- ▶ Display/keyboard
- ▶ PC-Software
- ▶ Potentiometer

Types of construction

- ▶ Plug-in versions
- ▶ Snap-on modules for mounting rails
- ▶ Eurocards

Additional versions

- ▶ Digital cards with software expanded to specific customer requirements
- ▶ Hardware for additional functions
- ▶ Software for solutions optimized with respect to application
- ▶ Flexible interface definition
- ▶ Electronics integrated into the valve

CARTRIDGES

Description

- ▶ Functional part for compact designs
- ▶ ISO screw-in cartridges
- ▶ Manual actuation by means of key or turning knob
- ▶ Electrical actuation by means of proportional- or switching solenoid
- ▶ For installation in control blocks and line mount bodies

Characteristics

- ▶ Direct- and pilot operated
- ▶ Functional part in flanged bodies and sandwich plates
- ▶ Standardized ISO screw cavities
- ▶ Simple and precise adjustment

Functions

- ▶ Poppet valves
- ▶ Pressure relief valves
- ▶ Pressure control valves
- ▶ Throttle valves
- ▶ Flow control valves
- ▶ Pilot-operated check valves

Nominal sizes

Screw-in cartridges:

- ▶ M18x1,5 ISO 7789
- ▶ M22x1,5 ISO 7789
- ▶ M33x2 ISO 7789

Additional versions

- ▶ Explosion protection
- ▶ Enhanced corrosion protection
- ▶ Line mount bodies
- ▶ Special functions



	M18	M22	M33
Qmax	25 l/min	100 l/min	230 l/min
pmax	400 bar	400 bar	400 bar



EXPLOSION - AND CORROSION PROTECTION

Description

- ▶ Extensive product range
- ▶ Electrical operating means for all explosion hazard areas
- ▶ Solutions for valves and systems
- ▶ Enhanced corrosion protection right up to stainless versions
- ▶ In applications, in which enhanced corrosion protection or explosion protection are required

Characteristics

- ▶ Explosion protection for gas, dust and mining
- ▶ Pressure-proof encapsulation and intrinsically safe
- ▶ in accordance with ATEX and IEC
- ▶ Three standardised corrosion protection stages up to AISI 316L

Functions

Explosion protection

- ▶ Directional control valves
- ▶ Poppet valves
- ▶ Pressure relief valves
- ▶ Pressure control valves

Corrosion protection

- ▶ Extensive range of functions

Nominal sizes

Explosion protection:

Screw-in cartridge:

- ▶ M22 and 33 ISO 7789

Flange, sandwich:

- ▶ NG4-Mini Cetop RP121 H-P02
- ▶ NG6 ISO 4401-03
- ▶ NG10 ISO 4401-05

Corrosion protection:

- ▶ Extensive range of hydraulic valves



MINIATURE HYDRAULICS

Description

- ▶ Space- and weight-saving valves
- ▶ Cartridges -, flange - and sandwich construction
- ▶ Complete product range with all standard functions and actuations
- ▶ In applications, in which smallest dimensions and weights are important

Characteristics

- ▶ High power density
- ▶ Compact construction
- ▶ Electric actuations with reduced power
- ▶ Reduced volume flows and high pressures

Functions

- ▶ Spool- and poppet valves
- ▶ Pressure relief valves
- ▶ Pressure control valves
- ▶ Throttle- and flow valves
- ▶ Check valves
- ▶ Pressure compensating valves

Nominal sizes

Screw-in cartridges:

- ▶ M18 x1,5 ISO 7789

Flange, sandwich:

- ▶ NG3-Mini Wandfluh standard
- ▶ NG4-Mini Cetop RP 121 H-P02
- ▶ NG4 ISO 4401-02

Additional versions

- ▶ Enhanced corrosion protection
- ▶ Explosion protection
- ▶ Switching position control
- ▶ Various types of electrical connections
- ▶ Special voltages
- ▶ Low power valves
- ▶ Special functions



	M18	NG3	NG4
Qmax	50 l/min	15 l/min	20 l/min
pmax	400 bar	350 bar	400 bar

INDIVIDUAL SOLUTIONS

Valves

- ▶ Combination of several proven functions within an element
- ▶ Application- and customer-specific solutions making use of the experience gained from standard components
- ▶ Implementation of explosion- and corrosion protection requirements
- ▶ Inclusion of special materials, surface treatments and processing procedures
- ▶ Special functions



Electronics

- ▶ Software expanded to specific customer requirements
- ▶ Hardware for additional functions
- ▶ Software for solutions optimized for the specific application
- ▶ Flexible interface definition
- ▶ Adaption to various fieldbus systems
- ▶ Electronics integrated in the valve



Control units

- ▶ Designed in accordance with customer specifications
- ▶ Manufactured on modern CNC-machining centers
- ▶ Individually put together using standard components
- ▶ Optimally aligned to customer requirements
- ▶ Collaboration with the customer in all product life phases
- ▶ Stacking systems
- ▶ Modular construction



Systems

- ▶ Elaboration of system solutions as per customer order
- ▶ Customer-specific solutions put together using available component modules
- ▶ Individual sales- and technical support
- ▶ Involvement of the specialists during the planning
- ▶ Hydraulics and electronics optimally matched to one another
- ▶ A lot of know-how from a single source
- ▶ From the engineering right to the commissioning





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